

Floor Carpet Installation System

The invention relates to a floor carpet installation system comprising a carpet forming the usable surface with its front side and an anchoring means that can be fixed to the floor, the anchoring means having upwardly protuberant interlocking elements which come into interlocking engagement with the backside of the carpet opposite the nap side.

A floor carpet installation system of this type is already known from EP 0 321 978 B1. With the known system the backside of the carpet incorporates loop elements protruding out over the make-up of the material, with which come into engagement hooks found on the anchoring means which can be fastened to the floor.

This type of anchoring of the carpet to the floor incorporates inadequacies. As has been shown, the cooperation of the hooks and the free loops found on the carpet backside prevent a lifting of the carpet, but this type of anchoring still does not provide sufficiently secure connection for the prevention of sliding along the carpet plane. Thus during use it can lead to formation of buckling and displacements, and especially with higher stresses, for example with sliding of heavy pieces of furniture, there exists the danger of great damage.

The object of the invention is to disclose a floor carpet installation system which guarantees a comparatively improved anchoring between carpet and floor.

With a floor carpet installation system of the aforementioned type this object according to the invention is attained in that the backside of the carpet turned toward the anchoring means is formed by a loopless material and that a micro-adhesive closing with anchoring elements in the

form of fingers with thicknesses at their ends is provided as anchoring means, wherein the thicknesses at the ends of the fingers interlock with the loopless backside of the carpet.

The cooperation of a micro-adhesive closing having anchoring elements in the form of fingers with thicknesses at their ends with a loopless carpet backside leads to an especially rigid connection when considered in terms of the relative movements along the carpet plane, but also, with overcoming of the holding force, facilitates a lifting of the carpet without tearing of the anchoring means or of their interlocking elements, which under certain conditions represents an additional advantage, for example because following the execution of an intended lifting, a re-anchoring is possible without further procedures. In view of the fact that longitudinal sliding is definitely prevented, no danger exists of bulges or displacements occurring, even with stronger stresses.

A micro-adhesive closing which is particularly suitable for the system according to the invention is known from DE 196 46 318 A1. According to the make-up of the material of the carpet to be installed, in other words according to the structure of the backside, a micro-adhesive closing with a thickness of the carrier of the interlocking elements of 0.1 to 0.5 mm and with 20 to 600 interlocking elements per  $\text{cm}^2$  can be used.

The thicknesses of the fingers of the interlocking elements can have the shape of mushroom heads or plate-shaped heads, whereby the heads are preferably provided on their tops with concave depressions. A method for particularly simple manufacture of micro-adhesive closings with such interlocking elements is suggested in German patent application 198 28 856.5.

With use of interlocking elements having depressions on the tops of their heads, the depressions on the heads can be provided with an adhesive allowing for an additional connection with the

backside of the carpet, for example by scraping the adhesive on the heads.

Textile materials in the form of felts or fleeces, or else loose breaker fabric or smooth stitches, as well as non-woven textiles, can be provided as backside of the carpet.

Hereinafter the invention is to be described in greater detail relative to the drawing. Therein can be found :

- Fig. 1        a diagrammatically simplified and broken open cross section of a floor carpet with open nap and loopless backside;
- Fig. 2        a perspective, greatly enlarged view of a microplast-adhesive closing part, whereby one individual interlocking element is represented still larger and in cross section;
- Fig. 3        a view corresponding to that of Fig. 2, whereby depressions on the tops of the heads of the interlocking elements are provided with adhesive, and
- Fig. 4        a broken open plan view in almost natural size of the loopless backside of the carpet of Fig. 1.

Fig. 1 shows in enlarged, diagrammatic simplified representation a cross section through a floor carpet with nap elements 1 of the traditional type, which extend upward from a connection layer 3 and which form the nap side of the carpet, serving as the usable surface. The backside 5 opposite the nap side is formed of a loopless material. For this purpose materials can be considered which lend the carpet structure a certain rigidity, directional alignment stability and tear resistance. In this case felt or fleece can be used, which obtain their mechanical composition by the tufting method and are glued with the connection layer 3 of the carpet. Loose breaker fabric or smooth right/left stitches and other so-called non-woven materials are also suitable for this purpose.

Fig. 2 shows a section of a strip of a microplast-adhesive closing 7 as it is disclosed in DE 196 46 318 A1. The thermoplastic (for example polyolefines or blends of polyamides come into consideration) strip formed in the gap between a pressure tool and a shaping tool forms a foil-like carrier 9 with fingers 11 protruding from its top. According to the mechanical construction and quality of the structure of backside 5 of the relevant carpet, the arrangement of fingers 11 has a packing density of approximately 20 to 600 fingers 11 per cm<sup>2</sup>, with a thickness of carrier 9 of approximately 0.1 to 0.5 mm. Other packing densities and/or thicknesses of carrier 9 can of course be considered according to the special circumstances.

As can be recognized particularly from the sectional representation shown greatly enlarged in Fig. 2, the thickened heads 13 of fingers 11 are formed into mushroom- or plate-shapes with concave arcuate tops, so that within the edge of each head 13 is found a depression 15.

With the example shown in Fig. 3 the depression 15 of head 13 is filled with an adhesive 17. This can be applied by spreading on or scraping on, in order to produce an additional connection following the interlocking engagement with backside 5 of the relevant carpet. Adhesives on acrylate base can be considered as adhesive material, for example 2-ethyl hexyl acrylate or butyl acrylate, preferably in different selected mixture ratios, in order to vary the plasticizing, plasticity and adhesive power as desired and as required.

With wall-to-wall installation of carpets, adhesive closings 7 can be provided in the form of long strips or bands. With installation of the carpet in tile-like or flagstone-like form, shorter, strip sections adapted in a suitable manner to the individual tile parts can be provided.